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ABSTRACT

General fund resource allocation and utilization in 27 academic departments at the University of California, Santa Barbara, during 1977-1984 were examined. A two-step research methodology was employed to provide a comprehensive analysis of possible budgetary determinants. The first step entailed a pooled multivariate regression analysis with eight department expenditure categories as dependent variables and nine potential predictive factors as independent variables. The second step entailed a series of interviews with 30 randomly selected department heads and staff regarding their perceptions of the budget allocation process. The results confirmed the importance of disciplinary differences in budgeting, revealed that student enrollments do not appear to be a major factor influencing department level resource allocations, and indicated a connection between faculty rank and budgets. The results also identified the importance of an economic dimension, an interpersonal dimension, and a reputational dimension for departments in the budget allocation process, while confirming that the external or macro model by which public universities acquire resources is not applicable to the internal or micro model by which resources are allocated to departments. (Author/SW)

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RESOURCE ALLOCATION AND UTILIZATION

IN ACADEMIC DEPARTMENTS: A CASE STUDY

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Ann K. Dickey, Chair
Forum Publications Editorial
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ABSTRACT

This case study examines general fund resource allocation and utilization in twenty-seven academic departments at UC Santa Barbara over the seven year period from 1977/78 through 1983/84. A two-step research methodology was employed to provide a comprehensive analysis of possible budgetary determinants. The first step entailed a pooled multivariate regression analysis with eight department expenditure categories as dependent variables and nine potential predictive factors as independent variables. The second step entailed a series of interviews with thirty randomly selected Department Chairpersons and Department Staff regarding their perceptions of the budget allocation process.

The results confirmed the importance of disciplinary differences in budgeting, revealed that student enrollments do not appear to be a major factor influencing department level resource allocations, and indicated a connection between faculty rank and budgets. The results also identified the importance of an economic dimension, an interpersonal dimension, and a reputational dimension for departments in the budget allocation process, while confirming that the external or macro model by which public universities acquire resources is not applicable to the internal or micro model by which resources are allocated to departments.

INTRODUCTION

The general perception of today's public doctoral granting research university is that of a diverse and highly complex organization, staffed with scholarly faculty steadfastly engaged in both the discovery and dissemination of knowledge. Because of the diversity of academic subjects and specializations available to faculty for teaching and research, and to students for learning and studying, the academic segment of universities is by necessity organized into departments or programs. The academic department, therefore, becomes the common ground where faculty and students interact, where knowledge is discovered, and where knowledge is learned.

This research focused on academic departments as the primary consumers of resources within a public research university. It utilized a case study methodology to ponder the seemingly simple question: what are the determinants of budget allocations to academic departments? Attempting to answer this question involved a close examination of academic resource allocation and utilization within the College of Letters and Science at the University of California, Santa Barbara (UCSB) for the seven year period from 1977/78 through 1983/84. The twenty-seven departments in the case study represented a broad cross section of the general liberal arts, including the Creative and Performing Arts, the Humanities, the Mathematics and Sciences, and the Social Sciences. The overall research approach was to isolate common factors between and among disciplinary areas which influence departmental general fund budget allocations.

The case study of the College of Letters and Science was designed using a two-step research methodology featuring both quantitative and qualitative analyses. The intention of this two-step methodology was to obtain a better understanding of departmental budget allocation and utilization in a public research university, which could then be generalized to other public doctoral granting institutions. Moreover, the design of the research focused exclusively on resource elements at the level of expenditure, providing an unusual bottom-up perspective to budgets as opposed to the more common top-down perspective to budgets. It must be remembered, that this bottom-up perspective was limited by its institution specific nature and by the particular conditions and circumstances unique to UCSB during the seven years under study.

LITERATURE REVIEW

The available literature on budgeting and financing postsecondary education in the United States is quite extensive, as is the general literature addressing issues of administration and management. However, the majority of this literature does not focus on the academic department budgetary process within institutions. The literature that is relevant to budgeting and financing higher education can generally be categorized to include: 1) public budgeting processes; 2) State and Federal financing of higher education; 3) costs and benefits of higher education; 4) retrenchment and program discontinuance; 5) management of higher education; and 6) resource allocations within institutions. An exhaustive review of the literature in

each of these categories was completed in conducting this research, and selected highlights from some of the eighty-eight primary sources are disclosed below.

Lee and Johnson (1977) defined public budgeting as a process for making choices about ends and means which involves making political decisions to allocate scarce resources. Wildavsky (1979) suggested that the intentions of budget-makers do not always match the reality of actual expenditures, and that the generally accepted paradigm of public budgeting as a rational process of ranking objectives, comparing alternatives, and selecting the highest does not describe how budgetary decisions are made.

The political dimension of resource management within higher education was confirmed in a case study of New York University by Baldrige (1971) which identified the political model of academic decision making in contrast to the bureaucratic or collegial models. Subsequent work by Baldrige, et al (1978), Chaffee (1983), Cohen and March (1974), Dressel (1981), McCorkle and Archibald (1982), Mortimer and McConnell (1978), and Walker (1979) explored various models of institutional governance, noting that academic goals are generally unclear, politicized, and highly contested, and that no single management model fits or describes all institutions or academic decision making situations in American universities.

With regards to the resource allocation process within institutions, Dressel and Simon (1976) proposed parameters to govern department budget allocations and concluded that

disciplinary differences and growing departmental power influenced budget decisions, making the traditional mode of incremental resource allocations no longer appropriate. Similarly, Hackman (1983) reported that environmental power and institutional power combined to explain a considerable portion of the variance in budget allocation changes for departments, while Cogan (1980) suggested that a department's power to acquire critical resources was highly correlated to the ability to obtain extramural funds. Tonn (1978) found that political behavior contributed to resource allocations and Hills and Mahoney (1978) concluded that budgeting conformed to a coalitional model of decision making during periods of resource scarcity. Pfeffer and Salancik (1974) argued in a case study of the University of Illinois that department budgets were impacted by power and social influence processes as measured by program reputation and faculty representation on committees. In a companion study, Salancik and Pfeffer (1974) determined that departmental power in the resource allocation process was correlated to extramural funding, national ranking, and relative size of graduate programs. Pfeffer and Moore (1980) confirmed the results of these two studies and also concluded that student enrollments were more highly correlated to budget allocations than departmental power for campuses facing less resource scarcity. Breneman (1971) and Garvin (1980) characterized institutions as prestige maximizing organizations where the ability of departments to generate and maintain prestige ultimately influenced resource allocations.

RESEARCH METHODOLOGY

As previously noted, the research design for the case study of the College of Letters and Science from 1977/78 to 1983/84 entailed two steps: 1) a quantitative analysis of seventeen variables for twenty-seven academic departments over the seven year period; and 2) a qualitative analysis based on interviews of thirty randomly selected Chairpersons and support staff who held departmental positions during the seven year period.

The twenty-seven academic departments analyzed were grouped into four traditional disciplinary clusters to facilitate comparative analysis, as follows:

Departments In Case-Study

Arts

Art History
Art Studio
Dramatic Arts
Music

Humanities

Classics
English
French/Italian
German/Slavic
History
Linguistics
Philosophy
Religious Studies
Spanish/Portuguese

Mathematics & Sciences

Biological Sciences
Chemistry
Environmental Studies
Ergonomics
Geography
Geological Sciences
Mathematics
Physics
Psychology

Social Sciences

Anthropology
Economics
Political Science
Sociology
Speech/Communication

Quantitative Analysis

Step One of the research design, or the quantitative analysis, involved a multivariate analysis of eight dependent variables and nine independent variables for the twenty-seven academic departments in the College. This analysis had two

separate components. The first component consisted of a primary regression analysis of eight dependent variables and eight independent variables using the Fuller and Battese variance component method (Drummond and Gallant, 1983) to generate results for the four models representing varying combinations of academic departments, plus a Collegewide model representing all departments. The second component consisted of a simplified regression analysis of eight dependent variables and a single independent variable using the General Linear Model to generate results for a reduced scale Collegewide model focusing on academic program quality. The dependent variables consisted of department expenditure levels in various categories, while the independent variables consisted of department enrollment levels, full-time equivalent positions, and other factors. All seventeen variables are listed below:

Variables Utilized in Quantitative Analysis

Dependent Variables

- *Academic salary expenditures
- *Staff salary expenditures
- *General assistance expenditures
- *Operating expense expenditures
- *Total support budget expenditures
- *Equipment expenditures
- *Computer instruction expenditures
- *Total general fund expenditures

Independent Variables

- *Permanent faculty FTE
- *Temporary faculty FTE
- *Ratio of senior faculty FTE
- *Teaching assistant FTE
- *Support staff FTE
- *Undergraduate student FTE
- *Graduate student FTE
- *Extramural funding received
- *National program quality ranking

The intent of the primary regression analysis was to examine both cross sectional and longitudinal differences for each department in each of the seven years under study. The Fuller and Battese method was selected since it yields regression coefficients for each variable based on a pooled analysis of the data which controls for relative cross sectional effects and relative longitudinal effects. As described by several authors such as Hannan and Young (1977), Maddala (1971), and Pindyck and Rubinfeld (1981), the principal advantage of pooling the data was the opportunity to simplify the statistical manipulation required to complete a complex econometric analysis. This simplification allowed examination of the entire seven year period in a single comprehensive analysis, while still accounting for department and time-based variations.

A second regression analysis was conducted to examine the interrelationship between the variables from the pooled analysis and the scholarly quality of academic programs. This analysis utilized the mean rating of the scholarly quality of departmental faculty as measured in the 1981 national study, An Assessment of Research/Doctorate Programs in the United States, conducted by the Conference Board of Associated Research Councils. This analysis was conducted separately since the national quality rankings were available only for a single year for seventeen departments.

Qualitative Analysis

Step Two of the research design, or the qualitative analysis, involved completion of a series of interviews with a randomly stratified sample of thirty Department Chairpersons and

support staff who held these positions at some time during the period from 1977/78 to 1983/84. The respondents included twenty Department Chairpersons and ten department administrative staff, selection of whom was based on the number of departments within a disciplinary area to ensure adequate representation of the four groupings:

Distribution of Interview Respondents

<u>Grouping</u>	<u>Chairs</u>	<u>Staff</u>	<u>Total</u>
Arts	3	2	5
Humanities	6	3	9
Mathematics and Sciences	7	3	10
Social Sciences	4	2	6
Total	20	10	30

The interviews consisted of structured questions plus a few open-ended questions. In the structured questions, respondents were asked to evaluate the relative importance of a range of quantitative, qualitative, and external factors in the allocations of resources to departments. Respondents were asked to rank whether they considered a factor very important, moderately important, or not important in departmental budget allocations. They also were encouraged to elaborate or explain their answers and were promised anonymity. The factors assessed are listed below:

Factors Utilized in Qualitative Analysis

Quantitative Factors

- *Undergraduate student FTE
- *Graduate student FTE
- *Permanent faculty FTE
- *Temporary faculty FTE
- *Ratio of senior faculty FTE
- *Teaching assistant FTE
- *Support staff FTE
- *Extramural funding
- *National program quality ranking

Qualitative Factors

- *Departmental prestige/pecking order
- *Relations with central administration
- *Faculty involvement in governance
- *Resource management performance
- *Programmatic credibility
- *Historical trends/reputation
- *Nature of discipline
- *Departmental size

External Factors

- *Condition of California economy
- *State budgetary priorities
- *Federal budgetary priorities
- *Relations between systemwide/state
- *Relations between campus/systemwide
- *Relations between campus/community

The major advantage of the interview process conducted in Step Two was that it brought to focus a number of subjective factors influencing departmental resource allocations which were difficult to evaluate in strict statistical terms. It also reaffirmed the limitations inherent in strict numerical analysis by revealing the importance of organizational behavior and processes in resource decision making.

Limitations

As with any research, this case study of the College of Letters and Science at UCSB had specific limitations:

- 1) The time period under study was only seven years, so the results are not representative of long-term resource decision making patterns.
- 2) The findings were specifically applicable to the College of Letters and Science at UCSB, and generally applicable to large colleges or schools of arts and sciences in public doctoral granting research institutions.
- 3) The limitations of institution specific data were further complicated by the interview results which indicated unique factors that influenced resource allocation and utilization.

4) All the quantitative results, as products of least squares regression, only reflect linear relationships between variables and combinations of variables, and do not infer causality.

5) All the qualitative results, as products of an interview process, only reflect individual perceptions and opinions, and can be biased by personal values, beliefs, and experiences.

Despite these limitations, it was still possible to utilize these research findings to better understand the determinants of budget allocations at the departmental level. Other studies have demonstrated general traits and patterns within certain types of institutions and among faculty, students, and staff, which allows for some generalizations based on the experiences at UCSB to similar institutions.

FINDINGS

The quantitative and qualitative findings from this case study of UCSB were quite extensive, so only the highlights can be summarized here. The detailed results are available in the research of Winans (1986). From the results, it was clear that a combination of factors, some easily measured and some not easily measured, contribute to the definition of each department's budget. However, any inferences drawn from these findings have certain limitations. The research design of this case study recognized the prior existence of academic departments and a predetermined campus pecking order in terms of permanent resource distribution. Therefore, synthesizing the quantitative and qualitative results must recognize the unique characteristics and conditions in existence at UCSB throughout the period under study, (including the institution, time period, respondents, and

variables) which qualifies the findings as well as their generalizability.

Overall, the case study afforded an opportunity to contemplate, from a resource management perspective, Rothblatt's observation (in Koepplin and Wilson, 1985, pg. 39) that "while it is possible for a single institution to accommodate multiple interests, it may not be the case that all interests can be served equally well". The findings support this observation since the patterns of resource allocation and utilization reflect differential treatment of departments in budget decision-making. However, this appears to be primarily a product of the qualitative or subjective nature of organizational behavior, as opposed to the quantitative or statistical relationships in the resource allocation process.

Quantitative Results

From the quantitative perspective, the first observation was that budget allocations were influenced by disciplinary differences inherent in academic departments, meaning that no clear statistical pattern emerged for describing the distribution of resources because of substantial variance due to cross sectional effects. This result was best explained by the nature of the academic enterprise as a complex collection of diverse scholarly specializations. Departments varied in terms of size, mode and level of instruction, and nature of scholarly inquiry, all of which altered the on-going instruction and research costs by discipline. Certain academic specializations were simply more expensive than others irrespective of other factors, so cross

sectional variation was anticipated when analyzing annual expenditures over a period of time.

Second, within each of the five models (e.g., Collegewide, Creative and Performing Arts, Humanities, Mathematics and Sciences, and Social Sciences) only a few of the independent variables were identified as having reasonably strong relationships to departmental budget allocations due to the relative magnitude of the reported regression coefficients. A modest picture of discipline specific budget determinants emerged including the importance of faculty rank and the unimportance of undergraduate enrollments and extramural contracts and grants. Consequently, the quantitative results allowed for the identification of a very limited statistical paradigm for describing the allocation of resources to departments.

Third, the commonly accepted enrollment-driven model used to allocate resources to institutions was not applicable to the internal allocation of resources at UCSB. Public universities throughout the United States share a common budgetary heritage in that general fund resources from their respective state governments are allocated primarily on the basis of student enrollments. These quantitative findings suggested that in a public research university during reasonably stable economic times, the internal allocation of resources did not follow the external model by which a campus received its general funds. This result was partly a product of the dual mission of the research university to discover as well as to disseminate knowledge, since the basic research of faculty rarely requires the presence of students in order to be properly conducted. This

result also was partly due to the level of institutional autonomy afforded to research universities, including considerable discretion with which to allocate resources for instruction and research. In this sense, the only restrictions tied to general fund expenditures were that they must be used to support instruction and research, but not necessarily in areas of high enrollment.

Fourth, many of the quantitative variables which explain some portion of department budget allocations reflect the number of full-time equivalent academic or non-academic staff, and therefore, were as much an indication of the salary intensive structure of university expenditures as anything. Universities, by their very nature, are labor intensive organizations, so it was a reasonable expectation that the number of academic staff (e.g., permanent faculty, temporary faculty, teaching assistants) and the number of support staff might be related to total expenditures, since salary expenses constituted the overwhelming majority of the general fund. This result meant that some of the position utilization variables functioned merely as natural determinants of budget allocations for salaries but not for other expenditure areas, further complicating the process of quantifying specific statistical indices for predicting departmental resource levels.

Qualitative Results

From the qualitative perspective, the first observation is that a considerable consensus was evident regarding eleven factors from the structured interview questions which were

considered very important in the departmental budget allocation process by two-thirds or more of the respondents: 1) program quality, 2) state budget priorities, 3) nature of discipline, 4) relations with central administration, 5) programmatic credibility, 6) condition of California economy, 7) extramural contracts and grants, 8) historical trends/reputation, 9) prestige/pecking order, 10) ratio of senior faculty FTE, and 11) relations between systemwide and state. Most of these factors reflected the unique culture and governance of research universities, and generally supported the quantitative results emphasizing departmental differences and the absence of an enrollment-driven internal resource allocation system. Interestingly, these eleven factors were not necessarily institution specific; they defined a broad interactive process within a large and complex higher educational organization engaged in teaching and research.

Second, the open-ended comments of respondents clearly indicated that departmental budget allocations were influenced in accordance with three interrelated dimensions: 1) economic dimension; 2) interpersonal dimension; and 3) reputational dimension. These three dimensions combined to help define the process governing resource distribution to academic departments.

The characteristics of the economic dimension included observations that the budget process was governed by scarcity, the condition of the external economy, enrollment levels (at least in a negative manner), inconsistent and ambiguous standards, and an unwritten rule that departments must be selective in requests. Although these responses were a mixture

of opinion and frustration, they helped define a structured economic sub-system of understandings (if not rules) which guided the allocation of resources to departments.

The characteristics of the interpersonal dimension included observations that the budget process was influenced by the personalities of the participants (including mutual cooperation and affinity between individual faculty, Department Chairpersons, and central administrators). These personalities were best reflected in a tendency toward centralized control by decision makers, a reactionary but supportive resource distribution process, and a belief in factional appeasement through individual budget augmentations to persistent faculty. In addition to the direct response of faculty and staff that personalities matter in budgeting, these other descriptions reveal how the interpersonal dimension, as expressed through managerial philosophy and style, was critical in departmental budget allocations.

The characteristics of the reputational dimension included observations that the perceived quality of an individual department or program was paramount in the budget process. This was expressed not only in the continued direct reference to quality by faculty and staff, but also in discussion of how budget allocations were influenced by a department's credibility, placement in the campus pecking order, and willingness to take risks and recommend new initiatives. Hence, departments were perceived as having particular programmatic reputations which generally were altered only through a change-based process of risk; meaning the reputational dimension reflected the fact that

departments never begin the resource acquisition process on an equal level.

Third, the departmental participants in the budget process consistently responded in a general tone or manner which indicated two philosophical beliefs: 1) other departments always fared better in the allocation of resources for a variety of reasons; and 2) the allocation of resources was always seen in negative terms. The perception that others received more budgetary support is not uncommon in any organization. In the case of the research university, it reflected the characteristic of departmental specialization, and the difficulty of scholars in one area to understand or appreciate the circumstances or needs of scholars in another area. It also reflected the cogent reality that resource distribution is rarely equitable from the perspective of those on the receiving end. The negative perception of the process was not surprising, and indicates a tendency to view resource distribution from the perspective of a glass being half-empty as opposed to half-full.

CONCLUSIONS

The combined quantitative and qualitative findings can be summarized in several conclusions:

1. The results were in accordance with some of the general observations from the literature.
2. Cross sectional or departmental differences are paramount in the resource allocation process.
3. In general, student enrollment was not a strong factor in budget allocations.
4. The proportion of senior faculty within a department was a factor in budget allocations.

5. In general, the number of support staff was the best comparative measure of departmental size when examining resource levels across disciplines.
6. Program quality was a major factor in budget allocations.
7. A department's ability to be, or appear to be, an agent of change was a factor in budget allocations.
8. Interpersonal relationships between campus participants was a strong factor in budget allocations.
9. Ultimately, there was an economic dimension governing the distribution of resources to departments.
10. The external or macro model by which the institution acquired resources was not directly applicable to the internal or micro model by which resources were allocated.

RECOMMENDATIONS

The results of this case study research suggest the following recommendations for additional research or consideration by other institutions:

1. Existing institutional research practices which emphasize strictly statistical cost analysis techniques for evaluating resource allocation and utilization should be broadened to include a balance between quantitative and qualitative methods of inquiry.
2. Additional case study research is necessary to evaluate the critical determinants in the departmental budget allocation process across the various segments of American higher education.
3. Additional research is necessary into the uncertain influence of student enrollments in the budget allocation process within research universities.
4. The apparent influence of the reputational dimension and the interpersonal dimension in department budget allocations reaffirms the critical need for greater consultation and peer review of resource decisions.
5. Public research universities should strive to eliminate the growing ad hoc emphasis in academic resource allocations by establishing in advance clear guidelines concerning budget allocations.

6. The various dimensions impacting upon budget allocations suggests that the selection of Department Chairpersons should be based in part on administrative skills.

7. Public research universities need to address more clearly the interrelationships between instruction and research.

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